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Patent
Attorney's Docket No. 027260-473

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	
Haruki KOYANAGI	Group Art Unit: 2815
Application No.: 09/884,933	Examiner: N. Nguyen
Filed: June 21, 2001	Appeal No.
For: LASER DIODE MODULE WITH STABLE OPTICAL OUTPUT	

BRIEF FOR APPELLANT

Mail Stop APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated April 24, 2003 (Paper No. 8), finally rejecting claims 1-6 and 8-11 , which are reproduced as in Appendix A to this brief.

A check covering the [ ] $160.00 (2402) [X] $320.00 (1402) Government fee and two extra copies of this brief are being filed herewith.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. A copy of this page and the signature page are submitted in duplicate.

perpendicular to the center line X which connects an optical fiber 40 to a light emitting device 20, it made the angle beta larger than the angle alpha of taper light." In this regard, it appears to Appellant that the machine translation "leaned to the field perpendicular to the center line X" means "leaned relative to the plane perpendicular to the center line X." Otherwise, the description in paragraph 20 would be inconsistent with Figures 1 and 7 of the Matsumoto et al. publication. Accordingly, even in view of this disclosure, it is apparent that the Matsumoto et al. publication does not disclose that the polarizer 11 is oriented perpendicular (i.e., normal) to an optical axis of the laser diode module as claimed in claim 9. Claims 9-11 are separately patentable over the Matsumoto et al. publication for at least this additional reason.

IX. Conclusion

In summary, for all the above-stated reasons, Appellant respectfully submits that the final rejection of claims 1-6 and 8-11 is in error and request that the Honorable Board reverse the Examiner's decision in this case. Appellant respectfully submits that claims 1-6 and 8-11 should be allowed.

In the event this paper is not timely filed within the currently set shortened statutory period, Appellant respectfully petitions for an appropriate extension of time. The fees for such extension may be charged to Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge Deposit Account No. 02-4800.

Respectfully submitted,
BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: Douglas H. Pearson

Douglas H. Pearson
Registration No. 47,851

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620
Date: September 23, 2003

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I. Real Party in Interest

The present application is assigned to Mitsubishi Denki Kabushiki Kaisha, as recorded in the U.S. Patent and Trademark Office at Reel 011939, Frame 0231.

II. Related Appeals and Interferences

The Appellant's legal representative, or assignee does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

The present application contains Claims 1-6 and 8-11, which have been finally rejected by the Examiner. These rejected claims are reproduced in Appendix A to this Brief. Claim 7 was canceled in the first Amendment dated February 25, 2003 after having been withdrawn from consideration in the December 23, 2002 Office Action as being directed to a non-elected species.

IV. Status of Amendments

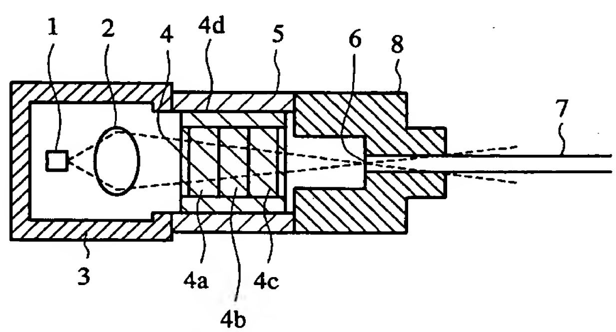
An after-final Amendment dated June 30, 2003 was submitted following the final Office Action, in which claims 1, 3, 4, 6 and 8 were proposed to be amended. The after-final Amendment was entered by the Examiner as reflected in the Advisory Action dated July 22, 2003 (Paper No. 10). The appealed claims listed in Appendix A include the amendments to claims 1, 3, 4, 6 and 8 made via the after-final Amendment.

V. Summary of the Invention

With regard to the appealed claims, the present invention is directed to a laser diode module that can provide a desired level of output in a stable manner and which can be fabricated easily. (Page 5, line 29 - page 6, line 2). Figure 1A of the present application (reproduced below) illustrates a sectional view of an exemplary laser module according to

the present invention. In Figure 1A, a laser beam (represented by the dotted line) is emitted by a laser diode 1 and enters a lens 2, which converges and directs the laser beam to an optical isolator 4 that comprises a polarizer 4a, a rotator 4b, an analyzer 4c, and a magnet 4d. The magnet 4d can cause the rotator 4b to rotate the direction of polarization of the laser beam passing through the rotator 4b by 45 degrees (e.g., clockwise by 45 degrees). A holder 5 holds the optical isolator 4 and is secured to a case 3. The laser beam exits the optical isolator 4 and converges on an end surface of an optical fiber 7 held by a holder 8 such that the end surface of the optical fiber 7 is positioned at a maximum coupling point 6. The laser beam thereby directed into the optical fiber 7 is then carried out of the optical module through the optical fiber 7. (Page 9, line 17 - page 10, line 6).

FIG.1A

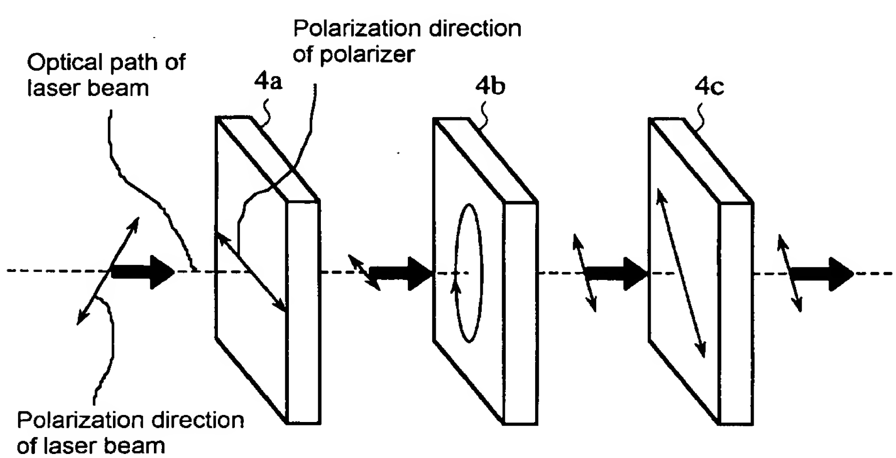


The optical isolator 4 prevents laser light that may be reflected from the end surface of the optical fiber 7 from returning to the laser diode 1. Such reflected light could otherwise adversely affect the output from the laser diode 1 if it re-entered the laser diode 1. In particular, the rotator can rotate the polarization of laser light that passes through the polarizer 4a clockwise by 45 degrees to match the polarization direction of the analyzer 4c. This laser light then passes through the analyzer 4c. A portion of the light may be reflected

from the end surface of the optical fiber 7, and the component of this reflected light that has a polarization direction matching that of the analyzer 4c will pass through the analyzer 4c toward the rotator 4b. The polarization of the reflected light passing through the analyzer 4c is then rotated clockwise by 45 degrees and travels toward the polarizer 4a. At this point, the polarization direction of the reflected light has been rotated clockwise by 90 degrees relative to the polarization direction of the polarizer 4a, and, therefore, cannot pass through the polarizer 4a. As a result, light reflected from the end surface of the optical fiber 7 is prevented from re-entering the laser diode 1. (Page 11, lines 26-29; page 3, line 6 - page 4, line 9; and Figure 7).

As illustrated in Figure 2 of the present application (reproduced below with annotations), the polarizer 4a is oriented such that the polarization direction of the polarizer 4a is rotated about an optical path of the laser beam relative to the polarization direction of the laser beam from the laser diode 1 (the laser beam directed toward the polarizer 4a in the example of Figure 2). (Page 10, lines 7-17). The language "rotated about an optical path" is used to indicate that the polarization direction of the polarizer 4a is oriented relative to the polarization direction of the laser beam from the laser diode 1 as if the optical path of

FIG.2

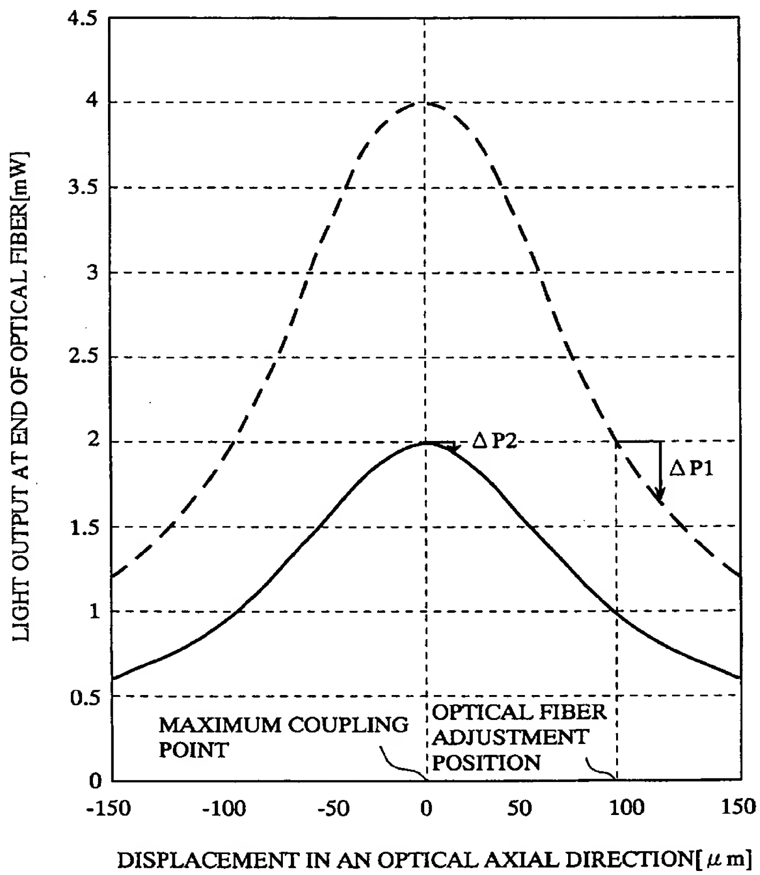


the laser beam were a rotation axis (e.g., like the axle of a tire) and as if the polarization direction of the polarizer 4a and the polarization direction of the laser beam from the laser diode 1 were rotated relative to each other about that axis. Moreover, the language "polarization direction of the laser beam from the laser diode 1" refers to the polarization direction of the laser beam prior to the laser beam being incident on the polarizer 4a and rotated by the rotator 4b.

By orienting the polarization direction of the polarizer 4a relative to the polarization direction of the laser beam in this manner, the present invention can provide an optical output from the optical fiber 7 at a desired level with enhanced stability. For example, it can be desirable to obtain an output power of about 2 mW (milliwatts) from the laser beam output from optical fiber 7 of the Figure 1A example, notwithstanding that the laser diode 1 can generate significantly greater power (e.g., could provide a 4 mW output at the optical fiber 7). By orienting the polarization direction of the polarizer at 45 degrees relative to the polarization direction of the laser beam directed thereto, for example, the intensity of the laser beam that passes through the polarizer 4a and that is output from optical fiber 7 can be reduced from about 4 mW (milliwatt), which would occur with a configuration in which the polarization direction of the polarizer is aligned with the polarization direction of the laser beam directed thereto, to a desired output of about 2 mW. (Page 12, lines 8-26). The above-described prior art configuration in which the polarization direction of the polarizer 4a is aligned with the polarization direction of the laser beam directed thereto is illustrated in Figures 6A, 6B and 7 of the present application and is discussed therein at page 1, line 11 through page 5, line 22. According to the prior art construction, a desired 2 mW output is achieved by displacing the end of the optical fiber 7 away from the maximum coupling point 6 by a certain distance to reduce the amount of light coupled to the optical fiber. (Page 13, lines 3-13).

Figure 3 of the present application (reproduced below) provides an explanation of stability enhancement in output power that the present invention can achieve compared to the above-described prior art configuration. Figure 3 shows a graph of light output from an

FIG.3



optical fiber (e.g., optical fiber 7 in Figure 1A) as a function of axial displacement of the end of the optical fiber from the maximum coupling point (e.g., maximum coupling point 6 in Figure 1A) for both the Figure 1A example of the present invention (solid line) and the prior art configuration (dotted line). As illustrated in Figure 3, if the optical fiber 7 of the Figure 1A example of the present invention were to suffer an accidental axial displacement of about 20 microns from the maximum coupling point 6 (e.g., due to deformation caused

by stress or temperature variations), the power output from the optical fiber 7 would drop, given the shape of the solid line, by only about 4 % (shown as ΔP2 in Figure 3). In contrast, if the optical fiber 7 of the prior art configuration were to suffer an accidental axial displacement of about 20 microns from the desired fiber location, the power output from the optical fiber 7 would drop, given the shape of the dotted line, by about 18.3 % (shown as ΔP1 in Figure 3). Thus, by orienting the polarization direction of the polarizer 4a at an angle relative to the polarization direction of the laser beam directed thereto, and by positioning the end surface of the optical fiber 7 at the maximum coupling point 6, the present invention can achieve a desired power output with enhanced stability against accidental fiber displacements compared to the prior art configuration, in which the polarization direction of the polarizer 4a is aligned with the polariztion direction of the laser beam directed thereto and in which the end surface of the optical fiber 7 is purposefully displaced from the maximum coupling point to achieve a desired power output. (Page 12, line 23 — page 13, line 27).

VI. The Issues

The final Office Action presents one issue for review on this appeal: does the Matsumoto et al. publication (JP 9-178974) disclose each and every feature of claims 1-6 and 8-11 in the combinations recited therein such that these claims are anticipated under 35 U.S.C. § 102(b)?

VII. Grouping of Claims

Appellants do not consider all of the rejected claims to stand or fall together under the final rejection based upon 35 U.S.C. § 102(b). For purposes of this appeal, claims 1, 2, 4, 5 and 8 may be grouped together based upon the grounds of rejection that have been applied against these claims. However, Appellant reserves the option of grouping these claims differently, should different grounds of rejection be applied by the Board. In

addition, for purposes of this appeal, claims 3 and 6 may be grouped together, and claims 9-11 may be grouped together.

Even if claims 1, 2, 4, 5 and 8 are found to be anticipated by the disclosure of the Matsumoto et al. publication, it is submitted that separate grounds of patentability exist with respect to claims 3 and 6 at least by virtue of the recitation therein wherein the polarization direction of the polarizer is angled against a direction of polarization of the laser beam from the laser diode at an angle that ensures a desired level of optical output from the optical fiber. Further, even if any or all of claims 1-6 and 8 are found to be anticipated by the disclosure of the Matsumoto et al. publication, it is submitted that separate grounds of patentability exist with respect to claims 9-11 at least by virtue of the recitation therein wherein the polarizer is oriented perpendicular to an optical axis of the laser diode module.

VIII. Argument

A. Claim 4 is not anticipated by the Matsumoto et al. publication at least because the Matsumoto et al. publication does not disclose a polarizer angled so that a polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from the laser diode.

Claim 4 stands finally rejected under 35 U.S.C. § 102(b) in view of the Matsumoto et al. publication. The Matsumoto et al. publication is directed to a module for optical communication that includes a light emitting device (e.g., a laser diode), a lens, a polarizer and other components described further below, wherein the module is configured to prevent light reflected from the polarizer from re-entering the light emitting device, thereby reducing distortion and instability in the light output of the module. (Paragraphs 8-12 of the translation of the Matsumoto et al. publication provided by the Office, hereinafter referred to as "the Matsumoto translation").

The Matsumoto et al. module is illustrated in Figure 1 therein, which has been reproduced above with the Examiner's markings thereon. As illustrated in Figure 1 of the Matsumoto et al. publication (hereinafter referred to as "Matsumoto Figure 1" for brevity),

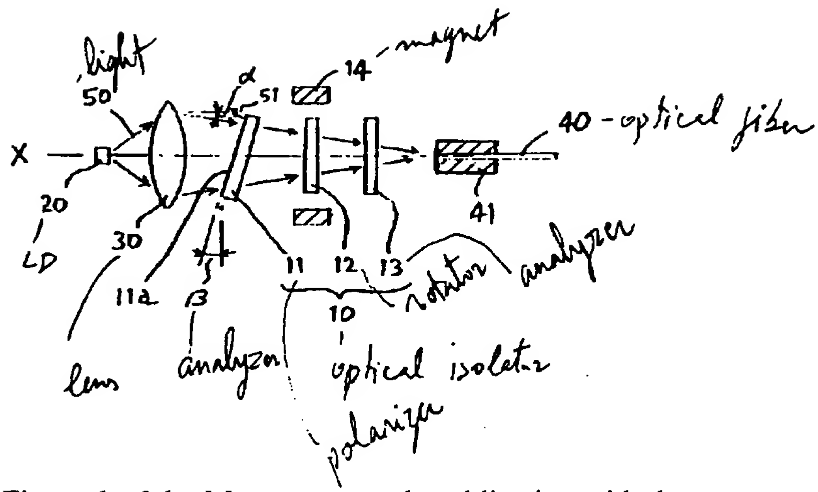


Figure 1 of the Matsumoto et al. publication with the Examiner's markings.

the module includes a light emitting device 20 (laser diode), a lens 30, an optical isolator 10, an optical fiber 40 and a ferrule 41 for holding the optical fiber 40. The optical isolator includes a polarizer 11, a rotator 12, an analyzer 13, and a magnet 14 that enables the rotator 12 to rotate the polarization of light passing between the polarizer 11 and the analyzer 13 such that light reflected from the optical fiber is prevented from returning to the light emitting device 20. (Paragraphs 3 and 17-19 of the Matsumoto translation). As shown in Matsumoto Figure 1, the polarizer 11 is oriented such that its plane of incidence 11a is leaned (tilted) from the vertical at an angle β that is greater than an angle α at which emitted light is converged by the lens 30, such that emitted light reflected from the plane of incidence 11a of the polarizer 11 does not return to the light emitting device 20 via the lens 30. (Paragraphs 20 and 21 of the Matsumoto translation). In this regard, the Matsumoto et al. publication notes that a prior art device illustrated in Figure 7 therein possessed a polarizer 11 tilted from the vertical at an angle γ of about 3-5 degrees, wherein the convergence angle α of light from the lens 30 was also about 3-5 degrees. With such a configuration, emitted light reflected from the polarizer re-entered the light emitting device

20, causing distortion. The improvement disclosed in the Matsumoto et al. publication is to tilt the polarizer 11 at an angle β that is greater than an angle α at which emitted light is converged by the lens 30. In other words, the modules illustrated in Figures 1 and 7 of the Matsumoto et al. publication are described as being alike except for the angle of tilt from the vertical of the polarizer 11.

In rejecting claim 4, the Office alleged that the Matusmoto et al. light emitting device 20 (referred to by the Office as laser diode 20), lens 30, optical isolator 10 (with polarizer 11, rotator 12, and analyzer 13), and optical fiber 40 satisfied the recitations of the claimed laser diode, lens, optical isolator (with polarizer, rotator, and analyzer) and optical fiber in the configuration claimed. (See pages 3-5 final Office Action dated April 24, 2003 and page 2 of Advisory Action dated July 22, 2003). In response to Appellant's claim amendments in the after-final Amendment dated June 20, 2003, and arguments therein that the Matsumoto et al. publication did not disclose a polarizer as claimed, the Office responded by stating,

> Matsumoto et al clearly discloses on figure 7 the polarizer 11 is angled such that the polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of the laser beam transmitted by said lens 30. Note that element 12 in figure 7 of Matsumoto et al. is rotator. Further, Matsumoto et al. also teaches that the leaning plane of incidence 11a of the polarizer 11 is perpendicular to the center line X which is an optical axis of the laser diode module. (Page 2 of the July 22, 2003 Advisory Action).

It is not clear to Appellant whether the Office intended to refer to Figure 7 of the Matsumoto et al. publication in this regard, given that the previous rejections were based upon Matsumoto Figure 1, which was reproduced above. In any event, as noted above, the modules illustrated in Figures 1 and 7 of the Matsumoto et al. publication are described as being alike except for the different angles of tilt from the vertical of the polarizer 11. In view of the Office's comments set forth above, it appears that the Office views the tilted orientation of the polarizer 11 illustrated in Figures 1 or 7 of the Matsumoto et al.

publication as satisfying the limitation in claim 4 of "a polarizer angled so that a polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from the laser diode."

Appellant respectfully disagrees with the Office's assessment of the module disclosed in the Matsumoto et al. publication and submits that claim 4 is not anticipated by the Matsumoto et al. publication at least because the Matsumoto et al. publication does not disclose a polarizer angled so that a polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from the laser diode, as recited in claim 4. As noted above in the "Summary of the Invention" section of this Brief, the language "rotated about an optical path" is used to indicate that the polarization direction of the claimed polarizer is oriented relative to the polarization direction of the laser beam from the laser diode as if the optical path of the laser beam were a rotation axis (e.g., like the axle of a tire) and as if the polarization direction of the polarizer and the polarization direction of the laser beam from the laser diode were rotated relative to each other about that axis (e.g., by 45 degrees clockwise or counterclockwise). Moreover, the language "polarization direction of the laser beam from the laser diode" refers to the polarization direction of the laser beam prior to the laser beam being incident on the polarizer and rotated by the rotator.

In contrast, the disclosure in the Matsumoto et al. publication of a polarizer tilted from the vertical does not satisfy the recitation in claim 4 of a polarizer angled so that a polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from the laser diode. As noted above, the Matsumoto et al. publication discloses a polarizer 11 oriented such that its plane of incidence 11a is leaned (tilted) from the vertical at an angle β that is greater than an angle α at which light is converged by the lens 30, such that light reflected from the plane of incidence 11a of the polarizer 11 does not return to the light emitting device 20 via the lens 30. One of ordinary skill in the art would recognize from

Matsumoto Figure 1 (or Figure 7) that tilting the polarizer 11 from the vertical by a given angle is not the same rotating the polarizer 11 about an optical path of the laser beam (i.e., the center line X) in a clockwise or counterclockwise direction. Accordingly, the disclosure in the Matsumoto et al. publication of the polarizer 11 being tilted from the vertical by an angle does not satisfy the recitation in claim 4 of a polarizer angled so that a polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from the laser diode.

In addition, Appellant respectfully submits that the Matsumoto et al. publication is silent with regard to any rotational orientation (i.e., about the center line X illustrated in Matsumoto Figure 1) of the polarization direction of the polarizer 11 disclosed therein relative to the polarization direction of the incident light beam from the light emitting device 20. In view of such silence, Appellant respectfully submits that the Office cannot infer that the Matsumoto et al. module possesses a polarizer angled so that a polarization direction of the polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from the laser diode, as recited in claim 4. In this regard, Appellant further notes that the conventional prior art laser diode module discussed in the "Background of the Invention" and illustrated in Figures 6A, 6B and 7 of the present application is configured such that polarization direction of the polarizer is oriented to match the polarization direction of the incident laser beam, in contrast to the present invention. This aspect was also described above in the "Summary of the Invention" section of this Brief.

For at least the above-noted reasons, Appellant respectfully submits that claim 4 is not anticipated by the Matsumoto et al. publication.

In addition, it is worthwhile to provide some additional perspective on the prosecution history and the amendments which placed independent claims 1, 4 and 8 in their present forms. At the time of the final Office Action dated April 24, 2003, claim 1 recited, *inter alia*, "wherein said polarizer is angled so that a direction of polarization

permitted to pass through said polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam transmitted by said lens." To gain clarification of the final rejection, the undersigned telephoned the Examiner on May 19, 2003 and learned that the Office had interpreted this orientational language of claim 1 to mean that the direction of polarization of the *laser beam* was *subsequently* rotated after the laser beam passed through the polarizer. (See page 6 of the after-final Amendment dated June 20, 2003).

As noted in the after-final Amendment at pages 6-8, Appellant indicated that this was not what claim 1 recited, and Appellant further indicated that the above-noted language of claim 1 read in light of the specification was amply clear such that one of ordinary skill in the art would readily understand what was being claimed (and similarly for claims 4 and 8). However, in an effort to advance prosecution, Appellant proposed amending claim 1 to recite even more explicitly that the polarization direction of the *polarizer* is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam transmitted by the lens. Claims 4 and 8 were proposed to be amended in similar manners. In view of these above-described comments and claim amendments, Appellant respectfully submits that the orientational language relating to the polarizer as set forth in the independent claims is amply clear and should not be interpreted to mean that the direction of polarization of the *laser beam* is *subsequently* rotated after the laser beam passes through the polarizer.

B. Claims 1 and 8 are not anticipated by the Matsumoto et al. publication at least for reasons similar to those set forth for claim 4; claims 2, 3, 5, 6 and 9-11 are allowable at least by virtue of dependency.

Claim 1 recites, *inter alia*, that the polarizer is angled so that a polarization direction of said polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam transmitted by said lens. Claim 8 recites, *inter alia*, that the polarizer is oriented such that a polarization

direction of said polarizer is rotated about an optical axis of the polarizer relative to a direction of polarization of the laser beam incident upon the polarizer. Accordingly, Appellant respectfully submits that similar distinctions exist between the subject matter disclosed in the Matsumoto et al. publication and that recited in claims 1 and 8 as have been discussed above with respect to claim 4. Claims 1 and 8 are not anticipated by the Matsumoto et al. publication for at least these reasons. Claims 2 and 3 depend from claim 1, claims 5, 6 and 10 depend from claim 4, and claim 11 depends from claim 8. Accordingly, claims 2, 3, 5, 6 and 9-11 are allowable at least by virtue of dependency.

C. Claims 3 and 6 are separately patentable over the Matsumoto et al. publication at least because the Matsumoto et al. publication does not disclose angling the polarization direction of the polarizer against a direction of polarization of the laser beam from the laser diode at an angle that ensures a desired level of optical output from the optical fiber.

Claims 3 and 6 recite, *inter alia*, that the polarization direction of the polarizer is angled against a direction of polarization of the laser beam from the laser diode at an angle that ensures a desired level of optical output from the optical fiber. Appellant respectfully submits that claims 3 and 6 are separately patentable over the Matsumoto et al. publication at least because the Matsumoto et al. publication does not disclose this subject matter. In this regard, as noted in the "Summary of the Invention" section of this Brief, it was pointed out that by orienting the polarization direction of the polarizer 4a relative to the polarization direction of the laser beam, the present invention can provide an optical output from the optical fiber 7 at a desired level with enhanced stability. For example, by orienting the polarization direction of the polarizer at 45 degrees relative to the polarization direction of the laser beam directed thereto, the intensity of the laser beam that passes through the polarizer 4a and that is output from optical fiber 7 can be reduced from about 4 mW to a desired output of about 2 mW. For comparison, the prior art configuration described in the "Background of the Invention" of the present application, and discussed above in the "Summary of the Invention" section of this Brief, would achieve a desired 2 mW output

under the same laser power by displacing the end of the optical fiber 7 away from the maximum coupling point 6 by a certain distance to reduce the amount of light coupled to the optical fiber.

In contrast, the Matsumoto et al. publication discloses the goal of preventing distortion and instability in optical output from the module disclosed therein. (Abstract and paragraph 9 of the Matsumoto translation). To achieve this goal, the Matsumoto et al. publication discloses a configuration to prevent light reflected from the polarizer 11 from re-entering the light emitting device 20, wherein the polarizer 11 is oriented such that its plane of incidence 11a is leaned (tilted) from the vertical at an angle β that is greater than an angle α at which emitted light is converged by the lens 30. This configuration is said to prevent emitted light reflected from the plane of incidence 11a of the polarizer 11 from returning to the light emitting device 20 via the lens 30. (Paragraphs 20 and 21 of the Matsumoto translation). Thus, the Matsumoto et al. publication discloses improving stability and distortion, but does not disclose orienting the polarization direction of the polarizer 11 therein relative to the polarization direction of the incident laser beam to ensure a desired level of optical output from the optical fiber. For example, the Matsumoto et al. publication does not disclose orienting the polarization direction of the polarizer 11 relative to the polarization direction of the incident laser beam to adjust the level of optical output from a possible 4 mW, for example, to a desired 2 mW, such as disclosed in the present application, as noted above in the "Summary of the Invention" section of this Brief. Accordingly, claims 3 and 6 are separately patentable over the Matsumoto et al. publication for at least this reason.

D. Claims 9-11 are separately patentable over the Matsumoto et al. publication at least because the Matsumoto et al. publication does not disclose orienting the polarizer perpendicular to an optical axis of the laser diode module.

Claims 9-11 recite that the polarizer is oriented perpendicular to an optical axis of the laser diode module. These claims were added in the February 25, 2003 Amendment.

In rejecting these claims, the Office stated in the April 24, 2003 final Office Action (page 4), "Regarding claims 9-11, Matsumoto et al discloses on figure 1 all the structures set forth in the claimed invention 9-11." In the July 23, 2003 Advisory Action, the Office stated (page 2), "Further, Matsumoto et al also teaches that the leaning plane of incidence 11a of the polarizer 11 is perpendicular to a center line X which is an optical axis of the laser diode module."

Appellant respectfully submits that the Matsumoto et al. publication does not disclose a polarizer oriented perpendicular to an optical axis of the laser diode module as recited in claims 9-11, i.e., a polarizer configured such that its optical surfaces are oriented normal to an optical axis of the laser diode module. Frankly, given that the Office has acknowledged that the polarizer 11 therein has a leaning plane of incidence 11a, which is shown in Matsumoto Figures 1 or 7 as being tilted from a plane perpendicular to the center line X, it is not understood why the Office has maintained this ground of rejection. As noted above, the main objective of the Matsumoto et al. module is to prevent light reflected from the polarizer 11 from re-entering the light emitting device 20, and this objective is sought by orienting by the polarizer 11 such that its plane of incidence 11a is leaned (tilted) from the vertical at an angle β that is greater than an angle α at which emitted light is converged by the lens 30. Accordingly, it would be entirely inconsistent with the objective disclosed in the Matsumoto et al. publication to orient the polarizer 11 such that its optical surfaces (including 11a) are oriented perpendicular (i.e., normal) to the center line X. Claims 9-11 are separately patentable over the Matsumoto et al. publication for at least this reason.

As noted above, the July 22, 2003 Advisory Action states, "Further, Matsumoto et al also teaches that the leaning plane of incidence 11a of the polarizer 11 is perpendicular to a center line X which is an optical axis of the laser diode module." The Office has not cited a section of the Matsumoto translation to support this statement, but it appears that the Office may be referring to paragraph 20 of the Matsumoto translation, which states, "That is, although the above-mentioned optical plane-of-incidence 11a was leaned to the field

perpendicular to the center line X which connects an optical fiber 40 to a light emitting device 20, it made the angle beta larger than the angle alpha of taper light." In this regard, it appears to Appellant that the machine translation "leaned to the field perpendicular to the center line X" means "leaned relative to the plane perpendicular to the center line X." Otherwise, the description in paragraph 20 would be inconsistent with Figures 1 and 7 of the Matsumoto et al. publication. Accordingly, even in view of this disclosure, it is apparent that the Matsumoto et al. publication does not disclose that the polarizer 11 is oriented perpendicular (i.e., normal) to an optical axis of the laser diode module as claimed in claim 9. Claims 9-11 are separately patentable over the Matsumoto et al. publication for at least this additional reason.

IX. Conclusion

In summary, for all the above-stated reasons, Appellant respectfully submits that the final rejection of claims 1-6 and 8-11 is in error and request that the Honorable Board reverse the Examiner's decision in this case. Appellant respectfully submits that claims 1-6 and 8-11 should be allowed.

In the event this paper is not timely filed within the currently set shortened statutory period, Appellant respectfully petitions for an appropriate extension of time. The fees for such extension may be charged to Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge Deposit Account No. 02-4800.

Respectfully submitted,
BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: Douglas H. Pearson

Douglas H. Pearson
Registration No. 47,851

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620
Date: September 23, 2003

APPENDIX A

The Appealed Claims

1. A laser diode module comprising:

a laser diode;

a lens provided on an optical path of a laser beam emitted by said laser diode;

a polarizer provided on an optical path of the laser beam transmitted by said lens; and

an optical fiber provided at a location to which the laser beam transmitted by said polarizer is optimally coupled, wherein

said polarizer is angled so that a polarization direction of said polarizer is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam transmitted by said lens.

2. The laser diode module according to claim 1, wherein said optical fiber is provided in the vicinity of the location to which the laser beam transmitted by said polarizer is optimally coupled.

3. The laser diode module according to claim 1, wherein said polarizer is placed so that the polarization direction of said polarizer is angled against a direction of polarization of the laser beam from said laser diode at an angle that ensures a desired level of optical output from said optical fiber.

4. A laser diode module comprising:

a laser diode;

a lens provided on an optical path of a laser beam emitted by said laser diode;

an optical isolator provided on an optical path of the laser beam transmitted by said lens and including a polarizer, a rotator and an analyzer; and

an optical fiber provided at a location to which the laser beam transmitted by said optical isolator is optimally coupled, wherein

said optical isolator is placed so that a polarization direction of said polarizer of the optical isolator is rotated about an optical path of the laser beam passing through the polarizer relative to a direction of polarization of the laser beam from said laser diode.

5. The laser diode module according to claim 4, wherein said optical fiber is provided in the vicinity of the location to which the laser beam transmitted by said optical isolator is optimally coupled.

6. The laser diode module according to claim 4, wherein said optical isolator is placed so that the polarization direction of said polarizer of the optical isolator is angled against a direction of polarization of the laser beam from said laser diode at an angle that ensures a desired level of optical output from said optical fiber.

8. A laser diode module comprising:

a laser diode;

a lens disposed adjacent to the laser diode which receives a laser beam emitted by said laser diode;

a polarizer disposed adjacent to the lens which receives the laser beam transmitted by said lens; and

an optical fiber provided at a location to which the laser beam transmitted by said polarizer is optimally coupled, wherein

said polarizer is oriented such that a polarization direction of said polarizer is rotated about an optical axis of the polarizer relative to a direction of polarization of the laser beam incident upon the polarizer.

9. The laser diode module according to claim 1, wherein the polarizer is oriented perpendicular to an optical axis of the laser diode module.

10. The laser diode module according to claim 4, wherein the polarizer is oriented perpendicular to an optical axis of the laser diode module.

11. The laser diode module according to claim 8, wherein the polarizer is oriented perpendicular to an optical axis of the laser diode module.